

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**  
**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

**APPEAL BRIEF FOR THE APPELLANT**

**Ex parte Juichi KUBO et al.** (Appellants)

**OPTICAL FIBER WIRING METHOD AND ITS DEVICE**

Application Number: **10/572,377**

Filed: **February 1, 2007**

Appeal No.: **Not Yet Assigned**

Art Unit: **1747**

Examiner: **Daniel McNally**

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May 9, 2011

**BRIEF ON APPEAL**

**(I) REAL PARTY IN INTEREST**

The real party in interest is **MUSASHI ENGINEERING, INC.**, by an assignment recorded in the U. S. Patent and Trademark Office on **February 1, 2007**, at Reel **018839**, Frame **0932**.

**(II) RELATED APPEALS AND INTERFERENCES**

There are no other appeals or interferences known to appellant, appellant's legal representative, or assignee that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(III) STATUS OF CLAIMS**

Claims 1-13 are pending in the application. Claims 1-13 are rejected and all the rejected claims are appealed. The appealed claims appear in the Claims Appendix.

**(IV) STATUS OF AMENDMENTS**

No amendments have been filed subsequent to the close of prosecution.

**(V) SUMMARY OF THE INVENTION**

The present invention relates to an optical fiber wiring apparatus.

According to the optical fiber wiring method according to claim 1, an optical fiber is feeded to pass through an adhesive ejecting nozzle having an inner diameter larger than an outer diameter of the optical fiber. An adhesive is supplied to the adhesive ejecting nozzle. Thus, the surface of the optical fiber is coated with the adhesive. The amount of the adhesive applied to the optical fiber is kept constant by controlling an air pressure for pushing out the adhesive. An optical wiring is formed on a surface of a substrate while the optical fiber and the adhesive are simultaneously ejected from the adhesive ejecting nozzle. ([0006])

The optical fiber wiring apparatus of claim 7 has three elements: a liquid material ejecting unit, a controller, and a stage for supporting a substrate. The liquid material ejecting unit has a liquid material ejecting nozzle. The inner diameter of the liquid material ejecting nozzle is larger than the outer diameter of the optical fiber. The optical fiber and the adhesive can be simultaneously fed through the nozzle. The controller controls an air pressure for pushing out the adhesive. The stage supports the substrate on which the optical fiber is to be wired. The liquid material ejecting unit and the stage are movable relative to each other. ([0009]). The adhesive is pushed out by an air pressure and the air pressure is controlled by a controller. ([0020]).

According to the present invention, without expensive equipment, it becomes possible to form large-sized wiring or wiring for connection between substrates. Also, since the wiring is fixed by an adhesive, stable and space-saving wiring can be realized, and fiber management

regarding how the optical fibers are connected is easy to perform even when the number of optical fibers increases. Further, the present invention can form wirings on a substrate or on a plate connecting a plurality of substrates. ([0010])

**(VI) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

Claims 1, 3, 4, 7, 8, and 9 are rejected under 35 U.S.C. 103(a) for allegedly being obvious over Hisatsune (JP 61-62575A) in view of Swiggett et al. (US 4,693,778, "Swiggett") and Ikushima et al. (WO 02/103202A1, relying upon US 2005/0063839 as an English equivalent, "Ikushima")

Claims 2, 10, 11, 12 and 13 are rejected under 35 U.S.C. 103(a) for allegedly being obvious over Hisatsune, Swiggett and Ikushima, and further in view of Keyworth et al. (US 5,534,101, "Keyworth").

Claim 5 is rejected under 35 U.S.C. 103(a) for allegedly being obvious over Hisatsune, Swiggett and Ikushima and further in view of Keyworth et al. Hawkins (US 3,742,107).

Claims 6, and 10 are rejected under 35 U.S.C. 103(a) for allegedly being obvious over Hisatsune, Swiggett and Ikushima and further in view of Yamaguchi et al. (US 2001/0011413, herein "Yamaguchi")

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) for allegedly being obvious over Hisatsune, Swiggett and Ikushima, and further in view of Inaba et al. (US 2002/0112821, herein "Inaba").

## **(VII) ARGUMENT**

### **1. Claims 1, 3, 4, 7, 8, And 9 Are Not Obvious Over Hisatsune In View Of Swiggett et al. And Ikushima et al. Under 35 U.S.C. 103(a).**

In the Final Office Action of 12/09/2010, the Examiner alleged as follows:

2. Claims 1, 3, 4, 7, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hisatsune [JP61-62575A, of record, previously cited] in view of Swiggett et al. [US4693778, of record, previously cited, Swiggett"] and Ikushima et al. [W002/1 03202A 1, of record, previously cited, relying upon US2005/0063839 as an English equivalent, "Ikushima"] for the same reasons expressed in paragraph 2 of the Office action mailed 6/25/2010.

(Office Action of 12/09/2010, page 2). In the Office Action of 06/25/2010, the Examiner alleged:

Hisatsune discloses a method of applying a wire. The method comprises feeding a wire (3) to pass through an adhesive ejecting nozzle (5) having an inner diameter larger than the outer diameter of the wire (3), to obtain the wire (3) coated with the adhesive (4) on the wire surface, and forming the wiring on a surface of a substrate (1) by simultaneously ejecting the wire and the adhesive. Hisatsune disclose the wire can be any of plastic, paper and metal, but is silent as to the wire being an optical fiber. Hisatsune further discloses controlling the pressure in the nozzle to push out a constant amount of adhesive using a plunger/controller (8), and is silent as to controlling the air pressure for pushing out the adhesive.

Swiggett discloses a method for applying conductor wiring to a substrate. Swiggett discloses the conductor wiring may be wires for electrical conduction or optical fiber for conducting light (column 1, lines 10-13). The method comprises feeding an optical fiber though a guide onto a substrate where it is bonded with an adhesive to form the optical wiring.

Ikushima discloses a method of delivering a fixed quantity of liquid from a nozzle. Ikushima discloses there are known alternative methods for controlling the amount of liquid that is delivered though the nozzle (paragraph 0002). One method uses a plunger type device (as is used in Hisatsune) wherein a plunger is moved to pressurize the liquid so that a desired amount of liquid is ejected from the nozzle. An alternative method uses an air type delivering device wherein air is applied at a regulated

pressure to the liquid in the reservoir vessel so that a desired amount of liquid is delivered from the nozzle.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the method of Hisatsune by applying a wire that is an optical fiber as taught by Swiggett as a substitution of known wire types is well within the purview of one of ordinary skill, and to modify the method of Hisatsune by using an air pressure controller rather than the controller/plunger as taught by Ikushima as a substitution of known alternatives is well within the purview of one of ordinary skill.

(Office Action of 06/25/2010, page 2-3).

#### Hisatsune Not Analogous Prior Art

When a reference under 35 USC §103 is relied upon, it must be analogous prior art

(MPEP 2141.01(a)). The MPEP explains as follows:

The examiner must determine what is "analogous prior art" for the purpose of analyzing the obviousness of the subject matter at issue. \*\*>"Under the correct analysis, any need or problem known in the field of endeavor at the time of the invention and addressed by the patent [or application at issue] can provide a reason for combining the elements in the manner claimed. " *KSR International Co. v. Teleflex Inc.*, 550 U.S. \_\_\_, \_\_\_, 82 USPQ2d 1385, 1397 (2007). Thus a reference in a field different from that of applicant's endeavor may be reasonably pertinent if it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his or her invention as a whole.

(MPEP 2141.01(a) I). The present invention is directed to an **optical fiber wiring** method on a substrate and an optical fiber wiring apparatus.

On the other hand, Hisatsune discloses a method of sticking two plates together with putting a space piece between them. In order to improve efficiency, Hisatsune places a core coated with an adhesive, which is fed from a nozzle on a given position on the plate, piling the other plate on the core, pasting the plates together (Abstract, PURPOSE). Thus, Hisatsune is in

the field of **bonding two plates** together or in the field of **manufacturing a sheet holder** such as a card case.

Hisatsune is a reference in a field completely different from that of applicant's endeavour. Also, Hisatsune is not reasonably pertinent because the matter with which it deals, logically would not have commended itself to the present inventor's attention in considering his or her invention as a whole. Although Swiggett discloses an apparatus for scribing a conductor wiring to a surface of a substrate, the apparatus has nothing to do with Hisatsune's method.

Thus, for at least the reason that Hisatsune is not analogous prior art, the rejection based on the combination including Hisatsune has not established a prima facie case of obviousness. Also, the Examiner's allegation is nothing but a typical example of an impermissible hindsight analysis.

Additional reference, Ikushima, does not make the present invention obvious. Ikushima discloses a method of dispensing a constant amount of liquid from a nozzle. However, there is no reason why Ikushima's method of dispensing a constant amount of liquid from a nozzle is combined with Swiggett's method and apparatus for applying conductor wiring to a substrate.

Responding to Applicant's argument, the Examiner alleged as follows:

Applicant argues Hisatsune is in the field of bonding two plates together or in the field of manufacturing a sheet holder, and is not analogous prior art. Hisatsune's invention is the automatic coating and application of a coated wire to a substrate. Hisatsune is also in the field of applying adhesive coated wires, and the field of nozzles for applying coated wires. Furthermore, Hisatsune is solving the same problem as the claimed invention, improving the efficiency of applying a wire to a substrate by applying a coating of adhesive to the wire during application of the wire. Hisatsune is considered to be analogous prior art.

Applicant argues one would not be motivated to use expensive materials as optical fibers because it would destroy the intended purpose of Hisatsune. Hisatsune's purpose is to automatically coat and place a wire gap piece avoiding the use of skilled workers. Using a particular type of wire would not destroy the intended purpose of Hisatsune's invention.

(Office Action of 12/09/2011, page 3). However, the Examiner's allegation is based on impermissible hindsight analysis. The present invention is directed to an **optical fiber wiring** method on a substrate and an optical fiber wiring apparatus. There is no reason that the field of **manufacturing a sheet holder** such as a card case draw the attention of a person of ordinary skill in the art of an **optical fiber wiring**.

The Examiner alleged that Swiggett teaches that wire application devices can apply a variety of wires including optical fibers. However, the description in Swiggett is irrelevant to Hisatsune. Swiggett describes as follows:

This invention relates to apparatus for making circuit boards and, more particularly, to apparatus for making circuit boards in which insulated conductors are applied and bonded to a nonconductive surface to form a conductive path between contact points thereon. The conductors may be **wires for electrical conduction or optical fibers for conducting light** between points or may be a mixture thereof.

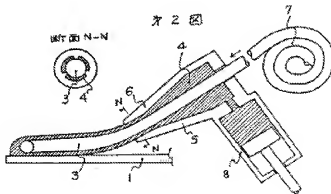
(Swiggett et al., column 1, lines 6-13). Swiggett simply indicates that wires for electrical conduction and optical fibers for conducting light are analogous. Nothing in Swiggett indicates that the field of **bonding two plates** together or in the field of **manufacturing a sheet holder** such as a card case is an analogous field of optical fiber wiring. Thus, despite the Examiner's allegation, the fact does not change that Hisatsune is not analogous prior art.



Control of Air Pressure

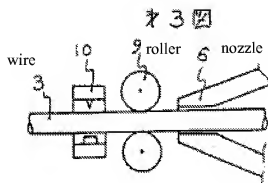
Claim 1 also recites “wherein an amount of the adhesive applied to the optical fiber is held constant by **controlling an air pressure** for pushing out the adhesive.” Similarly, claim 7 recites “a **controller to control an air pressure** for pushing out the adhesive.”

The Examiner’s allegation on this point regarding Hisatsune is not correct. As shown above, the examiner alleged that Hisatsune discloses controlling the pressure in the nozzle to push out a constant amount of adhesive using a plunger/controller (8), and is silent as to controlling the air pressure for pushing out the adhesive. However, the only explanation in Hisatsune is as follows: “The adhesive applied core wire is placed on a plate. In other words, the core wire is wound on the core wire hoop 7, and supplied continuously. On the other hand, the adhesive is extruded by adhesive extruder 8 through the nozzle 6 likewise.”



Also, as shown by Fig. 2 of Hisatsune, the plunger (8) is directly touching the adhesive (4) in the nozzle device (5). Thus, Hisatsune does not teach or suggest “a controller to control air pressure for pushing out the adhesive.”

Also, Fig. 3 of Hisatsune discloses rollers (9) for ejecting a wire (3) from a nozzle (6). Since Hisatsune discharges a large amount of the adhesive to bond two plates, it can dispose the rollers (9) in front of the nozzle (6). This architectural difference further makes it clear that the technical field of Hisatsune is different from this invention.



It also should be noted that not only the adhesive but a fiber is simultaneously ejected from the nozzle. In other words, even if the pressure is not given to the adhesive, a certain amount of the adhesive is ejected from the nozzle in conjunction with the ejection of the optical fiber. That is, the amount of the adhesive ejected from the nozzle is being changed according to the velocity of the optical fiber. Therefore, the air pressure must be controlled depending on the ejection speed of the optical fiber. Even if the air pressure is held constant, it does not follow that the amount of the adhesive is kept constant.

Thus, even if Ikushima is combined with Swiggett et al., Hisatsune, the same results as this invention will not be obtained.

For at least these reasons, claims 1 and 7 patentably distinguish over Hisatsune, Swiggett, and Ikushima.

**2. Claims 2, 10, 11, 12 and 13 are not obvious over Hisatsune, Swiggett and Ikushima, and further in view of Keworth et al. (US 5,534,101, "Keworth") Under 35 U.S.C. 103(a).**

Claims 2 and 12 depend from claim 1 and claims 10, 11 and 13 depend from claim 7. Therefore, these claims patentably distinguish over Hisatsune, Swiggett, and Ikushima.

Keyworth was cited for allegedly disclosing "controlling the speed at which the nozzle is moved relative to the substrate, which will affect the rate at which the optical fiber needs to be fed" and "dispensing an adhesive coating that is UV curable and using a UV lamp to cure the adhesive," and "a device that dispenses a liquid using an air pressure controller (28)."

However, such disclosures of Keyworth do not remedy the deficiencies of Hisatsune, Swiggett, and Ikushima.

For at least these reasons, claims 2, 10, 11, 12 and 13 patentably distinguish over Hisatsune, Swiggett, Ikushima and Keyworth.

**3. Claim 5 is not obvious over Hisatsune, Swiggett and Ikushima and further in view of Keyworth et al. Hawkins (US 3,742,107) under 35 U.S.C. 103(a).**

Claim 5 depends from claim 1. Therefore, claim 5 patentably distinguishes over Hisatsune, Swiggett, and Ikushima. As discussed above, the disclosure of Keyworth alleged by the Examiner does not remedy the deficiencies of Hisatsune, Swiggett, and Ikushima.

Hawkins was cited for allegedly disclosing "a method of making an optical fiber" and that "glass fibers are well known," and "polymeric optic fibers can be used and have the added benefit of increased strength and flexibility."

However, such disclosures of Hawkins do not remedy the deficiencies of Hisatsune, Swiggett, and Ikushima.

For at least these reasons, claim 5 patentably distinguishes over Hisatsune, Swiggett, Ikushima, Keyworth and Hawkins.

**4. Claims 6, and 10 are not obvious over Hisatsune, Swiggett and Ikushima and further in view of Yamaguchi et al. (US 2001/0011413, herein "Yamaguchi") under 35 U.S.C. 103(a).**

Claim 6 depend from claim 1 and claims 10 depends from claim 7. Therefore, these claims patentably distinguish over Hisatsune, Swiggett, and Ikushima.

Yamaguchi is cited for allegedly disclosing a method of wiring a substrate and the method comprising using a UV curable adhesive to secure a wire to a substrate and curing the adhesive by applying UV light after the wire is applied to the substrate (paragraph 0126).

However, such disclosures of Yamaguchi do not remedy the deficiencies of Hisatsune, Swiggett, and Ikushima.

For at least these reasons, claim 5 patentably distinguishes over Hisatsune, Swiggett, Ikushima, Keyworth and Yamaguchi.

**5. Claims 12 and 13 are not obvious over Hisatsune, Swiggett and Ikushima, and further in view of Inaba et al. (US 2002/0112821, herein "Inaba") under 35 U.S.C. 103(a).**

Claim 12 depend from claim 1 and claims 13 depends from claim 7. Therefore, these claims patentably distinguish over Hisatsune, Swiggett, and Ikushima.

Inaba has been cited for allegedly disclosing a method and apparatus for applying an adhesive and also discloses a syringe (113) with a nozzle (112) for dispensing the adhesive further discloses a pipe (passage 116) for supplying air from the air supply to the syringe to press out the adhesive (paragraphs 0003-0004).

However, such disclosures of Inaba do not remedy the deficiencies of Hisatsune, Swiggett, and Ikushima.

For at least these reasons, claims 12 and 13 patentably distinguish over Hisatsune, Swiggett, Ikushima, Keyworth and Inaba.

**(VIII) CONCLUSION**

For the foregoing reasons, the Examiner has failed to establish a prima facie case of obviousness in the rejection of the present claims. The Honorable Board is respectfully requested to reverse the rejection of the Examiner.

If this paper is not timely filed, appellants hereby petition for an appropriate extension of time. The fee for any such extension may be charged to Deposit Account No. 50-2866, along with any other additional fees that may be required with respect to this paper.

Respectfully submitted,

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Enclosures: Claims Appendix  
Evidence Appendix  
Related Proceedings Appendix

**(IX) CLAIMS APPENDIX**

1. (Rejected): An optical fiber wiring method comprising the steps of:  
  
feeding an optical fiber to pass through an adhesive ejecting nozzle having an inner diameter larger than an outer diameter of the optical fiber, to thereby obtain the optical fiber coated with the adhesive on a fiber surface, wherein an amount of the adhesive applied to the optical fiber is held constant by controlling an air pressure for pushing out the adhesive; and  
  
forming optical wiring on a surface of a substrate by simultaneously ejecting the optical fiber and the adhesive.
2. (Rejected): The optical fiber wiring method according to Claim 1, wherein the amount of the adhesive is held constant by further controlling a speed at which the optical fiber is introduced.
3. (Rejected): The optical fiber wiring method according to Claim 1 or 2, wherein the optical wiring is formed on the surface of the substrate by relative movement of the substrate and the nozzle where the substrate is held fixed and the nozzle is moved horizontally.
4. (Rejected): The optical fiber wiring method according to Claim 1 or 2, wherein the optical wiring is formed on the surface of the substrate by relative movement of the substrate and the nozzle where the nozzle is held fixed and the substrate is moved horizontally.

5. (Rejected): The optical fiber wiring method according to Claim 1 or 2, wherein the optical fiber is a polymer optical fiber.

6. (Rejected): The optical fiber wiring method according to Claim 1 or 2, wherein the adhesive is of the type being hardened with irradiation of an ultraviolet ray, and the optical wiring is formed on the substrate by irradiating an ultraviolet ray after the optical fiber coated with the adhesive on the fiber surface has been wired on the substrate.

7. (Rejected): An optical fiber wiring apparatus comprising:  
a liquid material ejecting unit provided with a liquid material ejecting nozzle having an inner diameter larger than an outer diameter of an optical fiber and allowing the optical fiber and the adhesive to be simultaneously fed through the nozzle;  
a controller to control an air pressure for pushing out the adhesive; and  
a stage for supporting a substrate on which the optical fiber is to be wired, wherein the liquid material ejecting unit and the stage are movable relative to each other.

8. (Rejected): The optical fiber wiring apparatus according to Claim 7, wherein the stage for supporting the substrate is fixed, and the nozzle is movable to form optical wiring on the substrate with the relative movement.



9. (Rejected): The optical fiber wiring apparatus according to Claim 7, wherein the nozzle is fixed, and the stage for supporting the substrate is movable to form optical wiring on the substrate with the relative movement.

10. (Rejected): The optical fiber wiring apparatus according to any one of Claims 7 to 9, wherein the adhesive is of the type being hardened with irradiation of an ultraviolet ray, and the apparatus further comprises an ultraviolet ray irradiation unit for irradiating an ultraviolet ray to harden the adhesive after the optical fiber coated with the adhesive on the fiber surface has been wired on the substrate.

11. (Rejected): The optical fiber wiring apparatus according to any one of Claims 7 to 9, wherein the controller controls a speed at which the optical fiber is introduced such that an amount of the adhesive is held constant.

12. (Rejected): The optical fiber wiring method according to Claim 1 or 2, wherein the optical fiber is passed through a storage section which is connected with the nozzle and a pipe for feeding air.

13. (Rejected): The optical fiber wiring apparatus according to any one of Claims 7 to 9, wherein the liquid material ejecting unit including a storage section which is connected with the nozzle and a pipe for feeding air.

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Appeal Brief  
Attorney Docket No.: 062284

**(X) EVIDENCE APPENDIX**

None Presented.

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Art Unit: 1747

Appeal Brief  
Attorney Docket No.: 062284

**(XI) RELATED PROCEEDINGS APPENDIX**

No related proceedings.